

### **REMARKS**

This is in response to the Office Action dated May 23, 2003. Claims 1-11 are pending.

Fig. 3 has been amended as requested by the Examiner, so as to label it "prior art."

#### **General**

For purposes of example, and without limitation, certain example embodiments of this invention relate to an LCD having a light diffusing element located at a front of the display panel for improving viewing characteristics of the display. For example, Fig. 1 of the instant application illustrates an LCD including a rear polarizer 102, a front polarizer 104, and a third polarizer (or polarizing element) 106. The light diffusing element 105 is sandwiched between at least the polarizers 104 and 106, all of which are located *in front of the liquid crystal layer 103*. As explained in paragraph [0031] of the instant specification, without the polarizing element 106, the light diffusing element 105 would retro-reflect light that has been incident on the front of the liquid crystal display device (i.e., externally incoming light) to its original direction, thereby whitening the image displayed on the screen and degrading the resultant display quality. However, if the polarizing element 106 is disposed in front of the light diffusing element 105 as shown in Fig. 1, at least some light that has been retro-reflected from the light diffusing element 105 can be absorbed into the polarizing element 106 and the degradation in display quality is reduced.

In addition, in certain example embodiments, the absorption axis of the polarizing element 106 is aligned with that of the front polarizer 104 disposed on the front of the liquid crystal layer 103; thus, almost all of the polarized light which has gone out of liquid crystal display panel 103 is transmitted through the polarizing element 106. As a result, the brightness of an image displayed on the liquid crystal display device does not significantly decrease.

#### Claim 1

Claim 1 stands rejected under 35 U.S.C. Section 103(a) as being allegedly unpatentable over Kameyama in view of Jones. This Section 103(a) rejection is respectfully traversed for at least the following reasons.

Claim 1 requires that "the light diffusing element is located between the front polarizer and the polarizing element all of which are located in front of the liquid crystal layer, and wherein an absorption axis of the polarizing element is substantially aligned with an absorption axis of the front polarizer." For example, Fig. 1 of the instant application illustrates light diffusing element 105 located between the front polarizer 104 and the polarizing element 106, *all of which are located in front of the liquid crystal layer* 103. As explained above, this claimed structure is highly advantageous in that at least some light that has been retro-reflected from the light diffusing element 105 can be absorbed into the polarizing element 106 and degradation in display quality may be reduced. As for the last paragraph of claim 1, Fig. 2B of the instant application illustrates that an absorption axis of the polarizing element 106 is substantially aligned with an absorption

axis of the front polarizer 104. The cited art fails to disclose or suggest the aforesaid quoted aspects of claim 1, either alone or in the alleged combination.

No cited reference discloses or suggests a light diffusing element located between the front polarizer and the polarizing element, all of which are located in front of the liquid crystal layer.

Kameyama fails to disclose or suggest any sort of polarizer in front of diffuser 7, and is fundamentally flawed for this reason. While Jones discloses polarizers 17 and 31, there is no disclosure or suggestion of any diffuser between such polarizers. In fact, the cited art teaches directly away from the invention of claim 1 since both Kameyama and Jones fail to disclose or suggest a polarizer located in front of a front diffusing element. There is absolutely no disclose or suggestion in the cited art of providing a polarizing element in front of a diffusion element that is located on a front side of an LC layer. Moreover, if one of ordinary skill in the art would have combined Kameyama and Jones, the result would have been the addition to Kameyama of an internal polarizer like in Jones – there still would be no polarizing element in front of Kameyama's diffuser. Thus, even if the two references were combined as alleged in the Office Action (which applicant believes would be incorrect in any event), the invention of claim 1 still would not be met.

Claim 3 requires "a first  $\lambda/4$  retarder disposed between the front polarizer and the light diffusing element; and a second  $\lambda/4$  retarder disposed between the light diffusing element and the polarizing element, wherein a slower axis of the first  $\lambda/4$  retarder forms

an angle of about 45 degrees with an absorption axis or transmission axis of the front polarizer, and wherein a slower axis of the second  $\lambda/4$  retarder forms an angle of about 90 degrees with that of the first  $\lambda/4$  retarder." For example, see Figs. 2B and/or 6 of the instant application. By providing the claimed axial relationships between the claimed retarders and polarizer(s), significant advantages may be realized. For example, by providing the second  $\lambda/4$  retarder, light that has been retro-reflected from the light diffusing element can be effectively absorbed by the polarizing element, so that degradation in display quality may be minimized; and by providing the first  $\lambda/4$  retarder light emitted from the display element may transmit through the front polarizer and polarizer element, so that brightness of the image displayed need not significantly decrease (e.g., see paragraphs 0031 and 0046 of the instant specification),

The cited art fails to disclose or suggest the aforesaid aspect of claim 3. The retarders of Umemoto and Miller have entirely different functions than those of claim 3. Moreover, both Umemoto and Miller fail to disclose or suggest that  $\lambda/4$  retarders are used, let alone on both sides of a diffusing element as called for by claim 3. The cited references are entirely unrelated to the invention of claim 3.

#### Claim 7

Claim 7 calls for "a light diffusing element, which is disposed in front of the display element; and a polarizing element, which is disposed in front of the light diffusing element." For example, Fig. 1 of the instant application illustrates a polarizing element 106 located in front of a light diffuser provided at the front side of an LC layer.

The cited art fails to disclose or suggest this aspect of claim 7. Both Kameyama and Jones fail to disclose or suggest a polarizing element located in front of a diffusing element on a front side of a display as called for by claim 7. The cited art is entirely unrelated to the invention of claim 7 in this respect. Thus, even if the references were combined as alleged in the Office Action (which applicant believes would be incorrect in any event), the invention of claim 7 still would not be met.

Claim 9

Claim 9 requires that "the light diffusing element is located between the front polarizer and the polarizing element all of which are located in front of the liquid crystal layer." Again, the cited art fails to disclose or suggest this aspect of claim 9, either alone or in the alleged combination.

Claim 10

Claim 10 requires a light diffusing element which is disposed in front of the display element, and a polarizing element disposed in front of the light diffusing element. For example, Fig. 1 of the instant application illustrates a polarizing element 106 located in front of a light diffuser provided at the front side of an LC layer. The cited art fails to disclose or suggest this aspect of claim 10. Both Kameyama and Jones fail to disclose or suggest a polarizing element located in front of a diffusing element on a front side of a display as called for by claim 10. The cited art is entirely unrelated to the invention of claim 10 in this respect. Thus, even if the references were combined as alleged in the

SATO, T. et al.  
Appl. No. 10/082,259  
August 20, 2003

Office Action (which applicant believes would be incorrect in any event), the invention of claim 10 still would not be met.

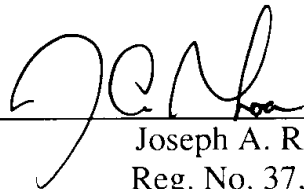
Conclusion

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. All claims are in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

**NIXON & VANDERHYE P.C.**

By: \_\_\_\_\_



Joseph A. Rhoa  
Reg. No. 37,515

JAR:caj  
1100 North Glebe Road, 8th Floor  
Arlington, VA 22201-4714  
Telephone: (703) 816-4000  
Facsimile: (703) 816-4100